

PATENT COOPERATION TREATY INTERNATIONAL SEARCH REPORT

IDENTIFICATION OF INTERNATIONAL APPLICATION		Applicant's or Agent's File Reference HETER-1CIP
International Application No. PCT/US88/03049	International Filing Date 02 SEPTEMBER 1988	
Receiving Office RO/US	Priority Date Claimed NONE	
Applicant INTEGRATED GENETICS		
I. <input type="checkbox"/> CERTAIN CLAIMS WERE FOUND UNSEARCHABLE: (Observations on supplemental sheet (2))		
II. <input type="checkbox"/> UNITY OF INVENTION IS LACKING: (Observations on supplemental sheet (2))		
III. TITLE, ABSTRACT AND FIGURE OF DRAWING		
1. The following indicated items are approved as submitted by the applicant: <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <input checked="" type="checkbox"/> Title. <input checked="" type="checkbox"/> Abstract. </div>		
2. The texts established by this International Searching Authority of the following indicated items are set forth below: <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <input type="checkbox"/> Title. <input type="checkbox"/> Abstract. </div>		
Text of the abstract continued on supplemental sheet		
3. a. <input type="checkbox"/> The definitive contents of the abstract are established by this International Searching Authority as proposed in form PCT/ISA/204 previously sent to the applicant. b. <input type="checkbox"/> This report is incomplete as far as the abstract is concerned as the time limit for comments by the applicant on the draft prepared by this International Searching Authority has not expired.		
4. Figure to be published with the abstract Figure No. <input checked="" type="checkbox"/> None of the figures. <input type="checkbox"/> as suggested by the applicant <input type="checkbox"/> because the applicant failed to suggest a figure <input type="checkbox"/> because this figure better characterizes the invention.		

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US88/03049

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all)		
According to International Patent Classification (IPC) or to both National Classification and IPC IPC(4): CO7K 13/00 C12P 21/02, C12N 15/00, C12N 5/00, C12Q 1/68, CO7H 15/12		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
U.S.	435/68, 70, 172.1, 172.3, 240.2, 320 536/27 530/399	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
Chem. Abs. DataBase 1967-1989 Keywords: leuteinizing hormone/express?/clon?/gene/DNA/recombinant follicle stimulating hormone/heterodimer/vector/plasmid		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X Y	Chemical Abstracts, Volume 108, No 3 issued 1987, 18 Jan. (Columbus Ohio, USA), Stewart, F "Application of recombinant DNA techniques to structure-function studies of equine protein hormones" See page 147, column 1-2, abstract no. 17058w, J. Reprod. Fertil. Suppl. (1987) 35: 1-8	38, 41 38-41
X Y	Chemical Abstracts, Volume 107, No 17 issued 1987, 26 October (Columbus Ohio, USA), Nilson, J. "Expression of the genes encoding bovine LH in a line of Chinese hamster ovary cells" See page 187, column 2, abstract no. 148529C, J Reprod. Fertil. Suppl. (1987) 34: 227-36.	1-7, 9, 10, 15, 25-28, 34, 35, 37-38, 40 8, 11-14, 16-24, 29-33, 36, 39, 41
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
11 May 1989	12 JUL 1989	
International Searching Authority	Signature of Authorized Officer	
ISA/US	 Anne Brown	

III. DOCUMENTS CONSIDERED TO BE RELEVANT. (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
Y	Chemical Abstracts, Volume 106, no. 17, issued 1987, 27 April (Columbus, Ohio USA) Schwartzbouer, J "Efficient and stable expression of recombinant fibronectin polypeptides". See page 173, column 1, abstract no. 132796f Proc Natl Acad Sci USA (1987) 84:754-8.	1-5, 8-14, 16-27, 29-37
Y	Chemical Abstracts, volume 103, no. 9, issued 1985, 2 Sept. (Columbus, Ohio USA) Reddy, V. "Heterodimeric human fertility hormones" See page 182, column 1-2, abstract no. 66081d, PCT WO 85 01959, 9 May 1985	1-41
Y	Chemical Abstracts, volume 103, no. 7, issued 1985, 19 August (Columbus, Ohio USA) Reddy, V. "Heterodimeric human fertility hormones" See page 146, column 1, abstract no. 49165d, PCT WO 85 01958, 9 May 1985	1-41
X Y OK	Kaetzel, D. et al (5 May 1988) J. Biol. Chem. volume 263: 6344-6351. "Methotrexate-induced amplification of the bovine lutropin genes in Chinese hamster ovary cells. Relative concentration of the alpha and beta subunits determines the extent of heterodimer assembly"	1-7, 9,10, 15, 25-28, 34,35, 37,38, 40, 8, 11-14, 16-24, 29-33, 36,39, 41
X Y OK	Kaetzel, D. et al (November 1985) Proc. Natl. Acad. Sci. USA, volume 82: 7280-7283 "Expression of biologically active bovine luteinizing hormone in Chinese hamster ovary cells".	1-7,10, 15, 25-28, 34,35, 37,38, 40 8, 11-14, 16-24, 29-33, 36,39, 41

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

X
Y

Chemical Abstracts, volume 109, no 7 issued 1988, 15 August (Columbus Ohio, USA), Kato, Y. "Cloning and DNA sequence analysis of the cDNA for the precursor of porcine follicle stimulating hormone beta subunit" See page 182, column 2, abstract number 49432a, Mol. Cell. Endocrinol (1988) 55: 107-12.

38, 39
40, 41,
3-5,
9, 10,
14,
16-20,
25-27,
31, 33,
35, 37

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers _____, because they relate to subject matter ¹² not required to be searched by this Authority, namely:

2. ☐ Claim numbers _____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out ¹³, specifically:

3. ☐ Claim numbers _____, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING²

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.